

Abstract Submitted
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pH-Triggered “Explosions” of Dually Responsive Polymer Micelles: Solutions *versus* Surfaces SVETLANA SUKHISHVILI, LI XU, Department of Chemistry, Chemical Biology and Biomedical Engineering, Stevens Institute of Technology, Hoboken, NJ 07030, OLEG BORISOV, Institut Pluridisciplinaire de Recherche sur l’Environnement et les Matériaux, EKATERINA ZHULINA, Institute of Macromolecular Compounds, Russian Academy of Sciences — We report on a pH-induced micelle-to-micelle phase transition of dually pH- and temperature-responsive spherical block copolymer micelles (BCMs) with weak polyelectrolyte coronae in solutions and at surfaces. In solutions, dynamic and static light scattering confirmed that sharp changes in micellar hydrodynamic size and aggregation number occur in a narrow pH range, $\Delta\text{pH} < 0.1$. In agreement with theory, ζ -potential measurements indicated an abrupt change in ionization of polymer chains in the micellar corona at the transition pH. At surfaces, monolayers of adsorbed micelles retained their inherent pH and temperature response properties, but in contrast to solution, the monolayer response was irreversible. Self-assembly of BCMs with polyanions inhibited the pH-induced transition, while self-assembled films showed reversible, temperature-induced swelling transitions.

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